

## Radiation Tolerant, High Capacity Non-Volatile Memory

Completed Technology Project (2013 - 2013)



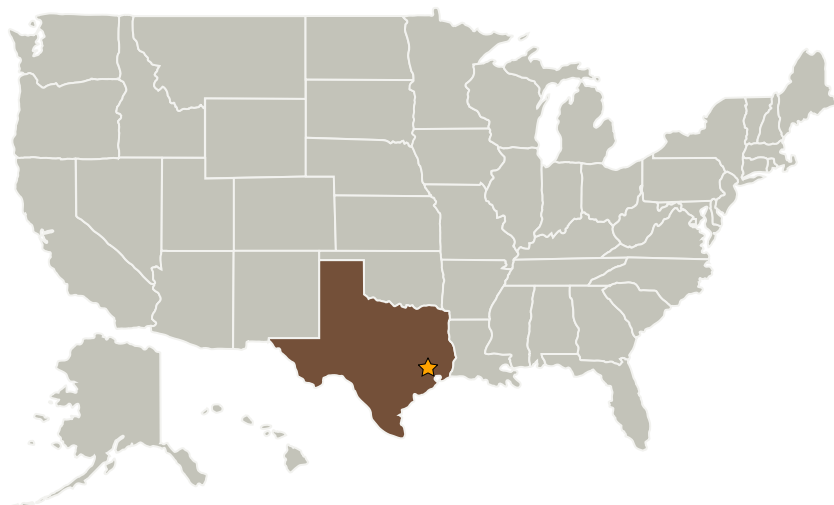
## Project Introduction

The need for reliable, high capacity, radiation tolerant nonvolatile memory exists in many Human space flight applications. Most projects rely on COTS hardware for a data storage system with very little assurance of radiation performance. The goal of this idea is to develop a high capacity nonvolatile memory system that is radiation tolerant. The concept uses commercially available nand-flash devices that are built with certain radiation immunity. To enhance radiation performance this concept incorporates error detection and correction. The concept is based on technology already explored by the Advanced Space Suit project. The purpose is to complete the work already started by the Advanced Space Suit project using available components. The first phase will prototype a design of the nand-flash memory array board interfaced to the error detection and correction algorithm implemented on an FPGA development board. Radiation testing will be performed by the JSC EV-5 radiation group.

## Anticipated Benefits

Reliable, high capacity, radiation-tolerant nonvolatile memory is needed in many space applications such as: TA04 Robotics, Tele-Robotics, & Autonomous Systems; TA05 Communications & Navigation; TA07 Human Exploration Destination Systems; TA06 Human Health, Life Support, & Habitation Systems; TA09 Entry, Descent, & Landing Systems

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

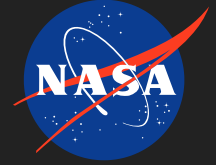
**Lead Center / Facility:**

Johnson Space Center (JSC)

**Responsible Program:**

Center Innovation Fund: JSC CIF

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Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Jacobs Engineering Group, Inc.	Supporting Organization	Industry	Dallas, Texas

## Primary U.S. Work Locations

Texas

## Links

NTR 1

(1383927814, <https://invention.nasa.gov/app/modules/technology/>)

## Project Management

**Program Director:**

Michael R Lapointe

**Program Manager:**

Carlos H Westhelle

**Project Manager:**

Manuel N Mauricio

**Principal Investigator:**

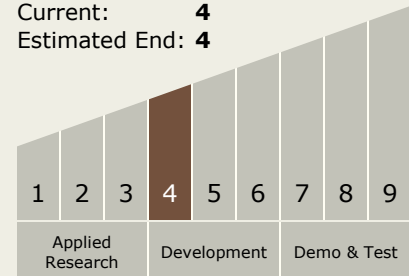
Manuel N Mauricio

## Technology Maturity (TRL)

Start: 4

Current: 4

Estimated End: 4



## Technology Areas

**Primary:**

- TX02 Flight Computing and Avionics
  - TX02.1 Avionics Component Technologies
    - TX02.1.4 High Performance Memories